

## APPLICATIONS 011' NASA SCATTEROMETER DATA FOR SEA ICE MAPPING

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NSCAT is the NASA scatterometer launched on the Japanese ADEOS-1 spacecraft for the remote sensing of ocean winds in August 1996. The applications of NSCAT data to the mapping and monitoring of sea ice edges are described in this paper. The trends of sea ice extents of the polar sea ice covers have been suggested as useful indicators of climate changes. Additionally, the location and change of ice edge in the Arctic are useful for the ship navigation in the coastal waters. Earlier studies of ice extent have relied principally on weekly maps of sea ice produced by the National Ice Center. These maps are the result of a subjective analysis of a combination of visible, infrared and passive microwave data from various spaceborne sensors as well as observations of opportunity from aircraft and ships. More recent investigations on polar sea ice have been based on the data collected by multi-frequency radiometers, including the Scanning Multichannel Microwave Radiometer (SMMR) instrument and Special Sensor Microwave Image (SSM/I). The SMMR and SSM/I data have been used to produce routine sea ice concentration maps. However, the most widely used algorithm developed by the Nimbus-7 SMMR team for SMMR and SSM/I radiometers remains affected by the spatial and temporal variations in the microwave signature of sea ice and local meteorological conditions.

A recent investigation has suggested that a dual-polarized scatterometer could be used to discriminate sea ice from open water and that a routine ice edge product derived from active microwave data could provide an interesting complement to the SSM/I estimates. This algorithm utilizes a combination of backscatter intensity and polarization behavior to separate the open water pixels from the sea ice pixels and has been successfully demonstrated with the dual-polarized backscatter data acquired by the SeaSat scatterometer during July of 1978. This paper describes this algorithm and presents the results of applications to NSCAT data to validate this algorithm for other seasons.

Preferred topic area: Oceanographic Applications  
Plenary presentation sessions preferred